

## COMPACT DESIGN – MANY EXTRAS

### NEW FUNCTIONS AND OPTIONS FOR ‘MINI’ SOLENOID INTERLOCKS

**The latest generation of the ultra-compact AZM40 solenoid interlock offers not only a range of new options, but also an extended temperature range and an additional degree of protection. In so doing, it opens up new areas of application, and not just for smaller guard doors.**



**Fig. 1:** Extremely compact and versatile in use – AZM40 solenoid interlock

The fact that an electronic solenoid interlock with ultra-compact dimensions of 119.5 × 40 × 20 mm is well suited to installation on small guard doors requires little explanation. It was for precisely this purpose that it was developed. However, aside from its compact design, the AZM40's property profile is so appealing that machine manufacturers have taken to using it on larger guard doors as well, even to safeguard accessible danger areas.

#### **Appealing for more than just its dimensions**

Reasons include simple installation, a holding force of 2000 N, which is remarkable for such a compact device, and flexible installation options. As the actuator tongue can enter the interlock's housing from three different sides at a 180° angle, one and the same model can be used to lock rotary and sliding doors. This allows for different installation

situations. The unique clamping principle, which holds the locking bolt in position, simplifies correct insertion of the locking bolt into the holding mechanism. RFID-supported secure communication between the interlock and actuator ensures a high level of security.

The bistable locking principle also brings practical benefits and in the event of a power failure, the AZM40 retains its current locking state. Consequently the user does not have to decide between load and closed current principle. In addition, the guard door is also kept securely closed in the event of power failure, thereby preventing hazardous run-on movements. What's more, energy consumption with the bistable principle is lower: when compared to monostable interlocks, power consumption can be reduced by more than 50%.

#### **Accessories to match the larger models**

In view of the high demand for this interlock series, and the wide range of possible applications, there is now an extended range of accessories, primarily to cover the safeguarding of accessible danger areas. These include a lockout tag to which a lock can be attached. This gives service employees the confidence that no one can close the guard door while they are working in the danger area. This prevents the machine from being started up unintentionally.

Furthermore, the new versions of the AZM40 can also be extended to include emergency release or emergency unlocking. The user has a choice of two actuation versions: lever and push button. Emergency release ensures that anyone who inadvertently becomes trapped can still escape the machine area. Emergency unlocking is used to ensure that the danger area in a machine can be reached quickly in case of emergency, such as a fire.

#### **Enhanced range of uses, extended service life**

These options expand the application options of the AZM40 still further, while the designer can utilise the special properties of this unconventional solenoid interlock in a number of different ways. This is supported by design optimisations across the entire



**Fig. 2:** The new versions of the AZM40 can also be extended to include emergency release and emergency unlocking.



**Fig. 3:** In another version, there is a push button for emergency release or emergency unlocking.

series. The temperature range in which the AZM40 can be used has been extended to -20°C to +55°C. In addition, the AZM40 is also available with IP69 degree of protection. At the same time, the service life has been extended to 500,000 switching cycles for the actuator cycles and one million switching cycles for the locking cycles.

Irrespective of the options, all AZM40s can be easily mounted on standard 40 mm profiles, without overhang. Universal mounting plate sets for the interlock and actuator are available for different profile system widths, again in the range of accessories.

#### Also for swivel-mounted double doors

An example of the versatile use of the AZM40 for safeguarding larger danger areas can be seen at the magazines and set-up stations of Wassermann Technologies GmbH. They dock directly onto machine tools and enable automated loading and unloading. The set-up station is secured with a swivel-mounted double door as a large opening angle is required for loading.

For reasons of design and space, the solenoid interlock was originally fitted at the bottom of the guard door, some distance from the door handles. From a design perspective, this is not ideal, as it can lead to uneven loads and warping. The AMZ40 is a better alternative. It can be easily installed at the height of and close to the door handles without interfering with handling of the pallets or the centring of the workpieces as a result of interfering contours.

#### Safeguarding of accessible danger areas

The robot cells used by the Berger Group are an example of how the AZM40 can be used on guard doors in accessible danger areas. The robot cells grind and sharpen blades. During operation, the compact solenoid interlocks prevent people from accessing the danger area. Benefits include the bistable operating principle and the fact that a single version can cover all use variants (left and right hinged rotary doors as well as sliding doors). Berger combines the AZM40 with BDF200 type control units so that the operator can actuate all functions – start/stop, emergency stop, release, reset... – right at the guard door itself, with full view of the process.

Schmersal will be showcasing another attractive combination of interlock and operation at SPS 2024 in Nuremberg: the AZM40 and the DHS door handle system, which integrates the 'interlock, door handle and LED display (handle illumination)' functions.



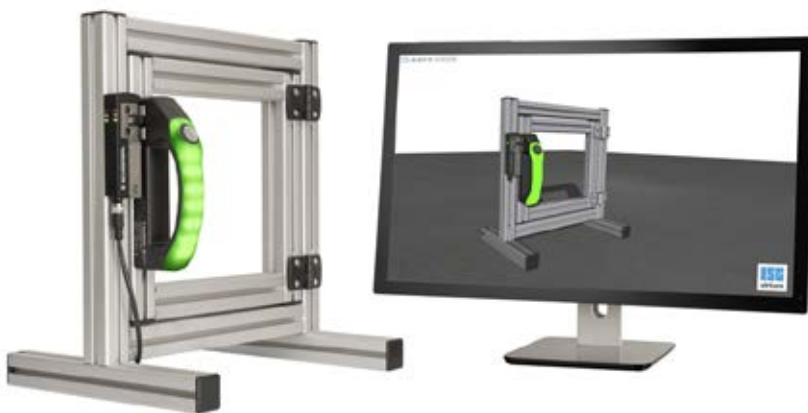
**Fig. 4:** For larger accessible machines, a lockout tag is available as an accessory for the AZM40.



**Fig. 5:** Wassermann Technologies uses the AZM40 on pivot-mounted double doors.



**Fig. 6:** The Berger Group uses the AZM40 to safeguard robot cells for blade grinding.



**Fig. 7:** The Schmersal Safety 4D model of the AZM40 and DHS door handle system simulates the properties and functions of the real operating and safety switchgear devices.

### The AZM40 as a digital twin in 4D

Schmersal will not only be showcasing the latest AZM40 model series 'live' at SPS 2024. The digital twin of the solenoid interlock will also be on display – as a unit with the DHS door handle system. In addition to the three-dimensional representation (3D), the virtual image simulates all properties and functions of the physical devices as a fourth dimension (4D). If, for instance, a guard door is unlocked using the real button on the door handle, the LEDs on the digital twin light up in the same way as on the physical counterpart. This makes Schmersal one of the very first companies to develop a digital twin for safety components.

The Schmersal Safety 4D model simulates not only individual components, but also complete process and control sequences using virtual mapping of signal flows. The benefit: In addition to early fault detection and optimisation, the 4D model will also aid with virtual machine commissioning in the future, even before the real machine has been mechanically assembled. This will help to save costs and reduce unnecessary development loops. It will also be possible to monitor components as a prerequisite for predictive maintenance. At SPS 2024, visitors will be able to experience the benefits of this special digital twin 'live'.



**Fig. 8:** A connector allows the control panel to be integrated effortlessly into the door system with AZM40 solenoid interlock and DHS door handle.

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